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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/020,481

11/30/2001

Axel K. Kloth

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10/18/2005

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ATLANTA, GA 30339-5948

EXAMINER

NGUYEN, HAO X

ART UNIT	PAPER NUMBER
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2668

DATE MAILED: 10/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/020,481	Applicant(s) KLOTH, AXEL K.	
	Examiner Hao X. Nguyen	Art Unit 2668	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7, 9-12, 14 and 16-20 is/are rejected.
- 7) ☒ Claim(s) 5, 6, 8, 13 and 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11/30/2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: on page 9, line 8, "egress" should be changed to "ingress". Appropriate correction is required.

Claim Objections

2. Claims 10 and 12-16 are objected to because of the following informalities: Claims 10 and 12-16 are for the redundant switching system, so they should be dependent on claim 9. Appropriate correction is required.

Claim 17 is objected to because of the following informalities: "the plurality of ..." should be changed to "a plurality of ..." since there is no basis for antecedent. Appropriate correction is required.

Claim 20 is objected to because of the following informalities: claim 20 is for the output line card, so it should be dependent on claim 19. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4, 9, 11, 12, 17, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abbiate et al (US Pat. No. 6,661,786 B1), hereafter Abbiate, in view of Bodnar et al (US Pat. No. 6,801,525 B1), hereafter Bodnar.

In regards to claims 1, 4, 9, 12, 16, 17, and 19,

Referring to Figure 2, Abbiate discloses a port adapter (an input line card) that receives an inbound cell.

However, Abbiate does not disclose an input line card that has a buffer to store inbound cells.

Referring to Figure 2, Bodnar discloses an ingress side 201 of a line card 200 that has a memory to store inbound cells (claims 1 and 9 - receiving an inbound cell in an ingress buffer).

It would have been obvious to one of ordinary skill in the art at the time of

the invention to modify an input line card of Abbiate to include a buffer to store inbound cells, as shown by Bodnar, so that cells can be transmitted to switch fabrics at a desired rate.

Assume claim 12 is dependent on claim 9.

Referring to Figure 2, Abbiate discloses a port adapter 30i that transmits copies of inbound cells to switch fabrics left and right. Inherently, the port adapter has a cell replicator that receives inbound cells from an ingress buffer (column 3, lines 35-40; claims 1, 4, 9, 12, and 17 - cell replicator that receives inbound cells from the ingress buffer and forwards copies of said inbound cells to the plurality of switch fabric elements).

Referring to Figure 2, Abbiate also discloses SCALs (RCV) (Switch core access layer) of both switch fabric left and right that receive cell copies (column 3, lines 35-40; claim 1 - receiving said cell copies in said plurality of switch fabric elements).

Referring to Figure 2, Abbiate also discloses an outbound cell that is forwarded from an SCAL (XMIT) ACTIVE of an active switch fabric left to a port adapter (XMIT).

However, Abbiate does not disclose an output line card that has a buffer to store outbound cells.

Referring to Figure 2, Bodnar discloses an egress side 201 of an line card 202 that has an output buffer to store outbound cells (claims 1 and 9 -

forwarding an outbound cell from a designated active switch fabric element to an egress buffer).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify an output line card of Abbiate to include a buffer to store outbound cells, as shown by Bodnar, so that cells can be transmitted to other nodes at a desired rate.

Referring to Figure 2, Abbiate discloses switch fabrics 10 and 20 that are mounted in a fault tolerance configuration, allowing each one of the switch fabrics to replace the other in case of breakdown. A processor located inside a switch core controls a masking mechanism. The masking mechanism regularly checks a backup path. In response to a detection of an error condition or a switch-over request, the masking mechanism is used to modify the repartition of the active elements and to permit maintenance operation to be performed. The maintenance process starts with the transmission of a Left Switch Over Request signal (column 1, lines 54-57; column 3, lines 28-40; column 4, lines 5-25; column 5, lines 25-33; column 7, lines 54-56; claim 1 - receiving a redesignation of the active switch fabric element during switch over; claims 9 and 16 - integrity manager that monitors the health of the plurality of switch fabric elements and designates an active switch fabric element and upon detecting an error in the active switch fabric element designates a different switch fabric element as the active switch fabric element and issues an active switch signal that indicates what switch fabric matrix is currently active).

Referring to Figure 2, Abbiate also discloses a port adapter (XMIT) that has the outbound cell interfaces with both switch fabric left and right. The port adapter (XMIT) selects a cell stream from one of outbound cell interfaces according to an external indicator Left Switch Over Request (L_SOV_R) (column 7, lines 54-57 and 62-66; claims 1, 9, and 19 – interface selection unit comprising a plurality of outbound cell interfaces and that selects a cell stream from one of said outbound cell interfaces according to an external indicator).

However, Abbiate does not disclose a cell dispatcher unit that retrieves cells from the egress buffer and dispatches said cells to external interfaces.

Referring to Figure 2, Bodnar discloses an output buffer of an output line card that inherently has a cell dispatcher unit dispatching outbound cells to a line interface 204 (claims 1, 9, and 19 – cell dispatching unit that retrieves cells from the egress buffer and dispatches said cells to external interfaces).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify an output line card of Abbiate to dispatch an outbound cell from an egress buffer, as shown by Bodnar, so that cells can be transmitted at a desired rate to external interfaces.

In regards to claim 11,

Referring to Figure 2, Abbiate discloses a port adapter 30i that transmits a sequence of cell1, cell2, and cell3 to both switch fabrics right and left. Inherently, there is a process to attach a cell sequence number to cells and then to store the cell with sequence number in the egress buffer (claim 11 – cell sequence

numbering unit that attaches a cell sequence number to a cell; and ingress buffer that stores the cell with sequence number).

Claims 2, 3, 7, 10, 14, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abbiate, in view of Bodnar, and further in view of Schulz (US Pat. No. 6,906,999 B1).

In regards to claims 2 and 10,

Assume claim 10 is dependent on claim 9.

Abbiate and Bodnar disclose the above limitations of claim 1, but they do not disclose steps of receiving a datagram from a physical interface; segmenting the datagram into a cell; and forwarding the cell to the ingress buffer using a cell manager.

Referring to Figure 2, Schulz discloses a striper ASIC (Application-Specific Integrated Circuit) that inherently has a buffer (an ingress buffer) and a processor (a cell manager). The striper receives a datagram from a physical interface, segments the datagram into a cell; and inherently forwarding the cell to the ingress buffer using a cell manager (column 4, lines 34-39; column 5, lines 27-31; claims 2 and 10 - steps of receiving a datagram from a physical interface; segmenting the datagram into a cell; and forwarding the cell to the ingress buffer).

It would have been obvious to one of ordinary skill in the art at the time of

the invention to modify an ingress buffer of Abbiate to receive a datagram from a physical interface, segment the datagram into a cell; and forward the cell to the ingress buffer, as shown by Schulz, so that bandwidth can be effectively utilized.

In regards to claim 3,

Referring to Figure 2, Abbiate discloses a port adapter 30i that transmits a sequence of cell1, cell2, and cell3 to both switch fabrics right and left. Inherently, there is a process to attach a cell sequence number to cells and then to store the sequence number in the egress buffer (claim 3 - attaching a cell sequence number to said cell and then storing the sequence number in the ingress buffer).

In regards to claims 7 and 14,

Abbiate and Bodnar disclose the above limitations of claim 1, but they do not disclose steps of selecting an outbound cell from the egress buffer; reassembling said outbound cell into a datagram; and conveying the datagram to a physical interface.

Referring to Figure 2, Schulz discloses an unstriper ASIC (Application-Specific Integrated Circuit) that inherently has a buffer (an egress buffer) and a physical interface. The unstriper receives data from all switch fabrics, inherently stores data in an egress buffer, re-assembles all segments into datagrams, and then inherently conveys the datagrams to a physical interface (column 4, lines 40-44; column 8, lines 53-57; claims 7 and 14 - selecting an outbound cell from the egress buffer; reassembling said outbound cell into a datagram; and conveying the datagram to a physical interface).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify an egress buffer of Abbiate to select an outbound cell from the egress buffer; reassemble said outbound cell into a datagram; and convey the datagram to a physical interface, as shown by Schulz, so that segments can be reassembled even though the datagram segments are being sent from more than one fabric and can arrive at the egress buffer at different times (Schulz; column 8, lines 48-57).

In regards to claim 20,

Claim 20 is assumed to be dependent on claim 19.

Referring to Figure 1, Abbiate discloses a port adapter (XMIT) (output line card) that organizes cells according to a cell sequence number (claim 20 – by organizing cells according to a cell sequence number).

Referring to Figure 2, Bodnar discloses an output line card 202 that has an egress buffer to store outbound cells, and an interface for outbound cells.

Abbiate and Bodnar also disclose the other above limitations of claim 19, but they do not disclose the synchronization of a cell stream selected by the interface selection unit to cells stored in the egress buffer.

Schulz discloses a synchronizer (an output network processor) that synchronizes a cell stream inherently selected by an interface selection to cells stored in the egress buffer (column 8, lines 53-57; claim 20 - the synchronization of a cell stream selected by the interface selection unit to cells stored in the egress buffer).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the output line card of Abbiate to include an output network processor that determines the synchronization of a cell stream selected by the interface selection unit to cells stored in the egress buffer by organizing cells according to a cell sequence number, as shown by Schulz, so that segments can be reassembled even though the datagram segments are being sent from more than one fabric and can arrive at the egress buffer at different times (Schulz; column 8, lines 48-57).

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Abbiate, in view of Bodnar, and further in view of Skirmont et al (US Pat. No. 6,385,209 B1), hereafter Skirmont.

Abbiate and Bodnar disclose the above limitations of claim 17, but they do not disclose an input network processor that, upon receiving a command, will adjust a read pointer to the ingress buffer in order to cause the ingress buffer to retransmit cells to the cell replicator.

Skirmont discloses packets that arrive a destination out of order are commonly dropped, and the dropped packets must be resent. Inherently, after cells are dropped, a command is sent to an input network processor to ask it or retransmit cells to the cell replicator. Upon receiving this command, the network processor will adjust a read pointer to the ingress buffer to cause the ingress buffer to retransmit cells to the cell replicator (column 4, lines 26-38; claim 18 -

an input network processor that, upon receiving a command, will adjust a read pointer to the ingress buffer in order to cause the ingress buffer to retransmit cells to the cell replicator).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify a method of Abbiate to include an input network processor that, upon receiving a command, will adjust a read pointer to the ingress buffer in order to cause the ingress buffer to retransmit cells to the cell replicator, as shown by Skirmont, so that packets can be properly reassembled at a destination (Skirmont; column 4; lines 33-38).

Allowable Subject Matter

4. Claims 5, 6, 8, 13 and 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Jones et al. (US Pat. No. 6,067,286) discloses Data Network Switch With Fault Tolerance.

Boura et al. (US Pat. No. 6,594,261 B1) discloses Adaptive Fault-Tolerant Switching Network With Random Initial Routing And Random Routing Around Faults.

Tada (US Pat. No. 6,487,169 B1) discloses Cell Switching Module With Unit Cell Switching Function.

Ganmukhi et al (US Pat. No. 5,953,314) discloses Control Processor Switchover For A Telecommunications Switch.

Chen, W.-S.E.; Kim, Y.M.; Yao, Y.-W.; Liu, M.T. (Computers and Communications, 1991. Conference Proceedings. Tenth Annual International Phoenix Conference on 27-30 March 1991 Page(s):703 - 709) discloses FDB: a high-performance fault-tolerant switching fabric for ATM switching systems:

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hao X. Nguyen whose telephone number is 571-272-8195. The examiner can normally be reached on M-F 8AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information

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for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hao X. Nguyen
Examiner
Art Unit 2662

A handwritten signature in black ink, appearing to read 'Chieh M. Fan', with a stylized flourish at the end.

CHIEH M. FAN
PRIMARY EXAMINER